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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,670	07/30/2003	Kazutoshi Onozawa	60188-602	6503

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EXAMINER

MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/629,670

Applicant(s)

ONOZAWA ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-17 is/are pending in the application.
- 4a) Of the above claim(s) 15-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 9-13 is/are rejected.
- 7) ☒ Claim(s) 8 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

In response to the amendment filed 10/20/2005, claims 1, 5-6, and 13 are amended, and claim 4 is cancelled. Claims 1-3 and 5-17 are pending.

### *Election/Restrictions*

Claims 15-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on 5/11/2005.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Song et al. (US 6,347,103). See especially Figs. 7A-7B and the discussion thereof, though the whole document is relevant.

Regarding claim 1, Song discloses a semiconductor laser comprising a substrate having a plurality of recessed portions (LD site) in its principal surface, a plurality of rectangular semiconductor laser chips 23,24 each disposed in the recess portions, wherein the chips are facet emission type in which a laser beam is emitted from a facet, the recessed portions are formed so

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that respective directions of emission of the lasers are aligned, a notch through which a laser-emitting portion of an associated one of the laser chips is exposed, formed in the substrate to face the laser-emitting portion (see beam lines in Fig. 7B, the beams enter a notch prior to hitting the mirror block 42), the laser-emitting portion is formed on the facet in a longitudinal direction of each of the laser chips, and the beam passing through the laser-emitting portion is emitted in a same direction as the longitudinal direction of each of the laser chips (the beam comes out of each laser along the horizontal direction in Fig. 7A, such direction also being a longitudinal direction).

Regarding claims 2-3, the lasers have different wavelengths, thus different optical outputs. See col. 5 lines 66-67.

Regarding claims 5-6, there are at least two notches through which the emitted portions are exposed, the notches being depressions that reach the bottom of the recesses. See beam lines in Fig. 7B

Regarding claim 7, while the shape of the laser is not explicitly discussed, it is inherent that since the lasers are only emitting from one end then there must be some difference in the facets and therefore a difference in shape.

Regarding claim 9, there is not explicitly disclosed a chip electrode and recess electrode for electrically contacting the laser. However, such features are inherent in Song's device. Song's laser diodes are electrically pumped and therefore must necessarily include the chip electrodes as claimed in order to operate. Furthermore, Song's substrate is made of silicon, and therefore cannot in and of itself provide the electrical connection. Therefore there must be some form of

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electrode on the submount. In order to form the requisite electrical connection, there will be an electrode in the recess.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song in view of Nemoto (US 6,643,310). Song discloses the limitations of the parent claims as shown above. It is not disclosed that the lasers differ in plan configuration (in accordance with wavelength or output in claims 11-12) and that the plan configuration of the recess portions vary according to the laser shapes. Nemoto teaches that in a multiple laser multiple wavelength laser system (such as the present invention) the lasers may differ in plan configuration in accordance with their wavelength and thus with their outputs. It would have been obvious to one skilled in the art to make the lasers of different plan configuration based on output/wavelength, so that plan configuration (i.e. cavity length in Nemoto) may be optimized for each particular laser/wavelength used, as taught by Nemoto. See col. 2 lines 41-48. While Nemoto is drawn to side by side lasers, the principal is equally applicable to the lasers of Song.

The recesses of Song are made for aligning the lasers, therefore the recesses will necessarily be formed in accordance to the laser shapes. If the laser shapes are different, as

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deemed obvious above, then the recess shapes will also be different so that the different lasers may fit therein.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song in view of Schatz (US 6,780,696). Song discloses the limitations of the claims as shown in the rejections of claims 1 and 9 above (i.e. the laser and substrate structure itself, as well as the chip and recess electrodes being inherent). It is not disclosed that the recess electrode extends beyond a principal surface of the substrate (i.e. the portions 21a and 22a of top view Fig. 5B, described so that electrical connection can be made to the bottom of the chips from the principal surface. see applicant's specification p. 16 lines 14-23). Schatz teaches in Figs. 3-2 and 3-3 similar devices formed in recesses, where the chips 310 are formed in recesses, where recess electrodes 320 extend beyond the principal surface at points 304 as described by applicant. It would have been obvious to include such a configuration, called clamping electrodes by Schatz, for the advantages described by Schatz. See col. 14 line 59 – col. 15 line 2.

### ***Response to Arguments***

Applicant's arguments filed 10/20/2005 have been fully considered but they are not wholly persuasive.

In light of the amendment, the section 102 rejections based on Hwu et al. (US 6,259,713), Smith et al. (US 5,824,186), and Shatz (US 6,780,696) are withdrawn. Rejections based on Song et al. (US 6,347,103) are not withdrawn and the arguments as to Song (Response at 8-9) are not persuasive for the following reasons.

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Applicant argues that “Song fails to disclose that the laser beams are emitted in the same direction as the longitudinal direction of each of the laser chips,” as now required by the claims. Applicant argues this is so because Song’s emitted beams are reflected by mirrors 27 (Song Fig. 2C) and thus are emitted perpendicularly to the longitudinal direction. This statement is incorrect. Regardless of any reflection that occurs after emission, it is clear that the beams as emitted are in the same direction as the longitudinal direction. They are reflected *after* emission, but nothing in the claims prevents changing of the beam direction after they have been emitted. The only requirement is the direction of the beam “passing through the laser-emitting portion.” The facet of Song’s lasers is the laser-emitting portion and the beams are along the longitudinal direction at that point.

***Allowable Subject Matter***

Claims 8 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 8, there is not taught or disclosed in the prior art a laser as in parent claim 1 where in each of the chips the output from the front facet is equal to that from the rear. Song contemplates no output from the rear whatsoever. Further, while it is known in the art to have some output from the rear facet in a laser diode for photodetection purposes, such an output is typically small, i.e. only enough for detection purposes, so that the majority of the wanted

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output comes out of the front; such a configuration does not allow for the claimed limitations of the front and rear outputs being equal.

Regarding claim 14, there is not taught or disclosed in the prior art a laser as in parent claim 13 where the recess electrode is shared by the chips. It appears fairly certain that in Song's device any recess electrodes could not be shared, since the chips are completely blocked off from one another by the mirror portion.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James Menefee  
November 17, 2005